

| Hazard ID | Situational Analysis | | | | | | |
|-----------|----------------------|-----------------------------|-----------------------|-------------------|--------------------------|-----------------------|--|
| | Operational Mode | Operational Scenario | Environmental Details | Situation Details | Other Details (optional) | Item Usage (function) | Situation Description |
| HA-001 | Normal Driving | Highway | Rain (slippery road) | High Speed | | Correctly Used | Normal driving on a highway during rain at high speed |
| HA-002 | Normal Driving | Country Road | Normal Condition | High Speed | | Incorrectly used | The driver is misusing the lane keeping assistance function as an autonomous function. |
| HA-003 | Normal Driving | Road with construction site | Normal Condition | High speed | | Correctly Used | Normal driving on a road with construction site at high speed |
| HA-004 | Normal Driving | Road with construction site | Normal Condition | High speed | | Correctly Used | Normal driving on a road with construction site at high speed |

| Hazard Identification | | | | | | Hazardous Event |
|---|---------------------------------|--|------------------------------------|--|---|-------------------------|
| Function | Deviation | Deviation Details | Hazardous Event (resulting effect) | Event Details | Hazardous Event Description | Exposure (of situation) |
| Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback | Actor effect is too much | The LDW function applies an oscillating torque with very high torque (above limit). | Collision with other vehicle | High torque (above a limit) can cause the steering wheel to oscillate and the driver to lose control of the vehicle. | LDW apply a high torque on a slippery wet road at high speed driving | E2 |
| Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane. | Function always activated | LKA function is always activated without any requirement for the driver to keep their hands on the steering wheel. | Collision with other vehicle | The driver is misusing the lane keeping assistance function as an autonomous function and collides with another vehicle as he does not observe the traffic. | LKA is active and the driver is not required to keep hands on steering wheel. | E3 |
| Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback | Function unexpectedly activated | Camera subsystem fail to pick correct lane and LDW function incorrectly vibrates the steering wheel | Collision with other vehicle | Camera subsystem generates a faulty signal (due to construction site lane markings) and the driver is alerted, this might cause a human error and a collision with another vehicle | LDW issues an incorrect warning which distracts the driver. | E2 |
| Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane. | Function unexpectedly activated | Camera subsystem fail to pick correct lane and LKA incorrectly attempts to stay on the incorrect lane. | Collision with other vehicle | Camera subsystem generates a faulty signal (due to construction site lane markings) and the LKA attempts to follow an incorrect lane which results in a deviation and a collision | LKA attempts to follow an incorrect lane | E2 |

| Classification | | | | | Determination of ASIL and Safety Goals | |
|--|---------------------------------|--|---|--|--|---|
| Rationale (for exposure) | Severity (of potential harm) | Rationale (for severity) | Controllability (of hazardous event) | Rationale (for controllability) | ASIL Determination | Safety Goal |
| Driving on a rainy highway doesn't occur on a daily basis | S3 | Losing control of the vehicle on high speeds on a highway can cause fatal injuries | C3 | The driver can take control of the steering wheel | ASIL C | The LDW function shall be torque limited to avoid oscillations and loss of control. |
| This scenario occurs can occur on a daily basis for all drivers. | S3 | Losing control of the vehicle on high speeds on a highway can cause fatal injuries | C1 | The majority of drivers will be able to regain control of the vehicle. | ASIL B | The LKA function shall be time limited and the additional steering torque shall end after a given time interval so that the driver cannot misuse the system as an autonomous driving feature. |
| Driving on a constructions site is not a common event | S3 | Departing a lane on high speeds on a construction site can cause fatal injuries | C0 | Controllable in general | QM | The LDW function shall not be active in case of a camera subsystem malfunction |
| Driving on a constructions site is not a common event | S3 | Departing a lane on high speeds on a construction site can cause fatal injuries | C1 | The majority of drivers will be able to regain control of the vehicle. | ASIL B | The LKA function shall not be active in case of a camera subsystem malfunction |